



WHAT WE KNOW ABOUT THE BRAIN AND HOW TO USE IT IN THE CLASSROOM

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BRAIN-Y TECHNOLOGIES

- CAT scans: Computerized Axial Tomography
 - X-ray pictures of slices of the brain that are then translated into snapshots of brain structure with use of a computer.
- MRI: Magnetic Resonance Imaging
 - Uses powerful magnets and radio waves to measure blood flow and determine how the brain works.
- PET scans: Positron Emission Tomography
 - Uses safe amounts of radioactive chemicals added to the blood stream to show which areas of the brain are working.
- BEAM: Brain Electrical Activity Mapping
 - Maps electrical currents to show the brain at work.



30,000 neuroscientists are studying the brain today.

THE BRAIN NEEDS FUEL!



SLEEP



**1.hormone
secretion**

**2.restoration
of energy**

**3.organization
and storage
of learning
into long-
term memory**

CONSEQUENCES OF SLEEP DEPRIVATION



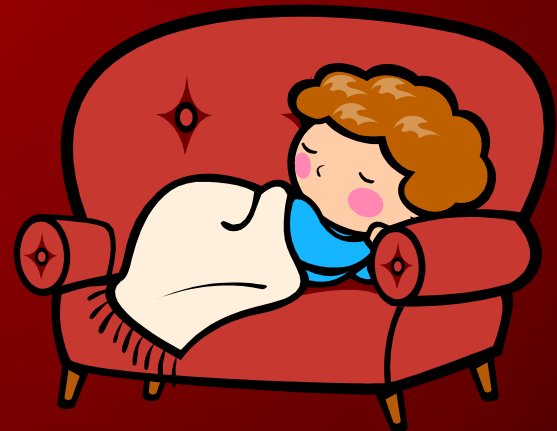
- sleepiness
- irritability
- anxiety
- decreased

**A BRAIN THAT IS NOT
ABLE TO OPERATE AT
OPTIMAL FUNCTION!!**

- decreased vulnerability
- drug and alcohol use
- increased likelihood of accidents
- inability to process new information or learning
- reduced creativity

HOW MUCH SLEEP?

- Preschoolers: 11 hours
- Elementary students: 10.5 hours
- Middle schoolers: 10 hours
- High schoolers: 8.5 hours
- Adults: 8 hours



**WE'RE AT THE MERCY OF OUR
*CIRCADIAN RHYTHM!***

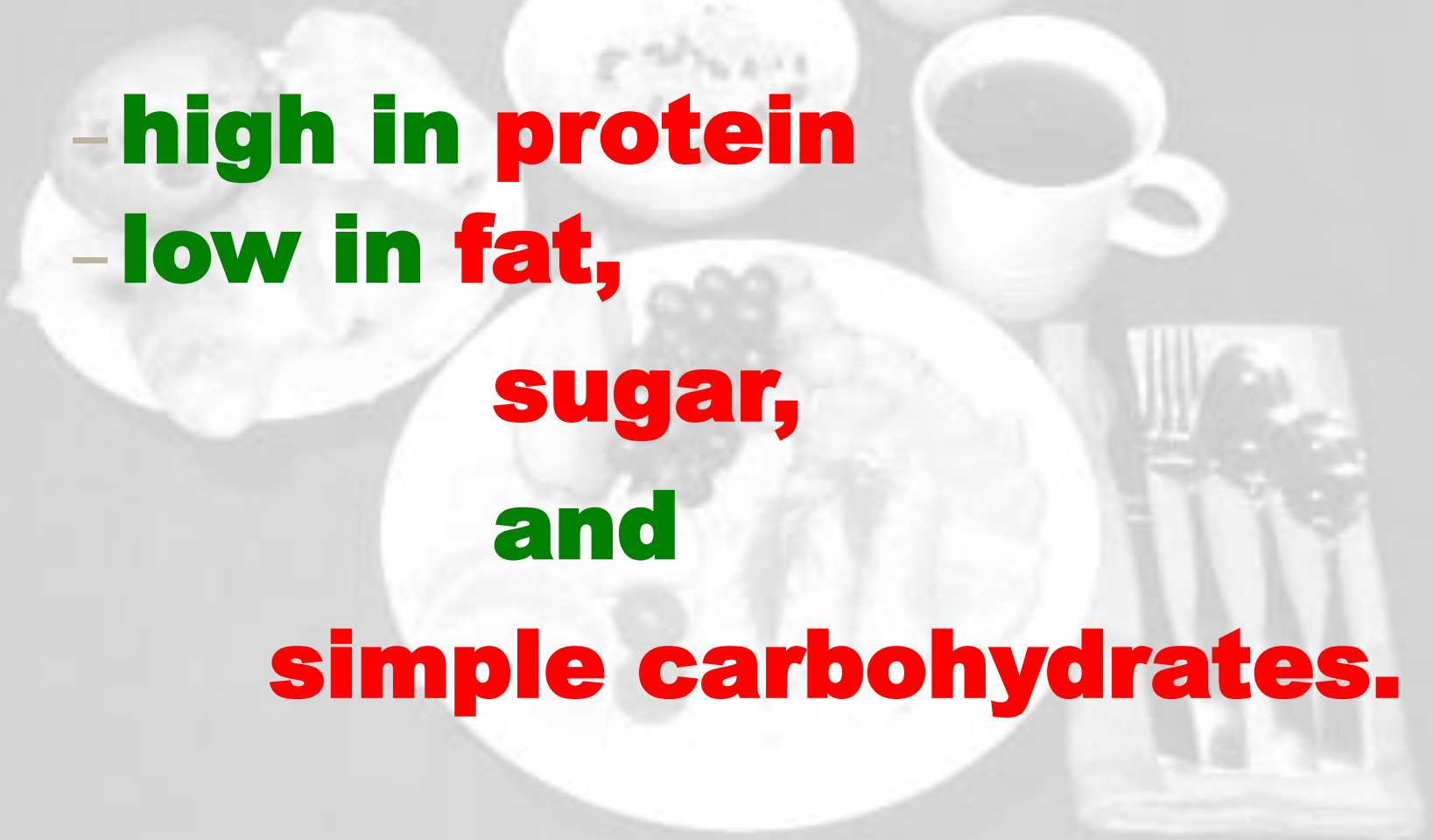


**WE NEED TO FEED THE
BRAIN.**



MOM KNOWS BEST: EAT YOUR BREAKFAST!

- **high in protein**
- **low in fat,**
sugar,
and
simple carbohydrates.



GRAB AND GO BREAKFASTS:

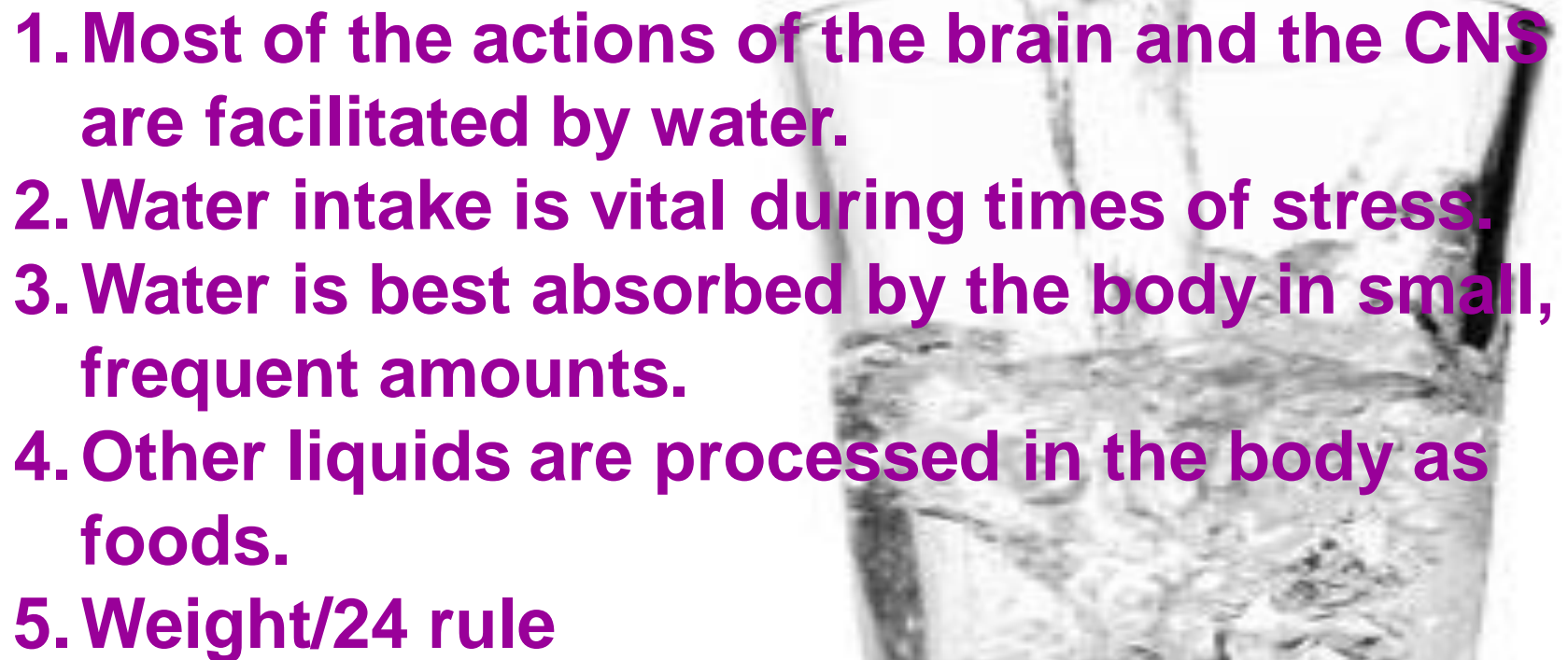
- A bagel with a slice of low-fat cheese and apple juice
- A banana, a piece of string cheese and a muffin
- A tortilla wrap with slices of low-fat ham and cheese
- An English muffin with peanut butter and some milk
- A carton of yogurt, a low-fat granola bar and a carton of orange juice
- An apple, a whole-wheat roll and a hard-boiled egg
- A peanut butter and jelly sandwich made on whole wheat bread with low-fat milk
- A piece of leftover pizza with orange juice
- A baggie of trail mix and a carton of low-fat milk

EASY 1-2-3 BREAKFASTS:

- Toaster waffles with applesauce or berries and low-fat milk
- Breakfast burritos with scrambled eggs and veggies and low-fat milk
- An English muffin pizza with sauce and mozzarella cheese, and orange juice
- Whole-grain cereal, sliced banana and low-fat milk
- A yogurt parfait with layers of granola and canned fruit with orange juice
- A grilled ham and cheese sandwich on whole wheat bread with veggie juice
- Microwave quesadillas with low-fat cheese and salsa and low-fat milk
- Pancakes with sliced peaches, vanilla yogurt and orange juice
- Oatmeal breakfast bars, fruit salad and low-fat milk
- A fruit smoothie (fruit and low-fat milk whirled in a blender)

**WATER CAN BOOST
BRAIN FUNCTION.**



- 
1. Most of the actions of the brain and the CNS are facilitated by water.
 2. Water intake is vital during times of stress.
 3. Water is best absorbed by the body in small, frequent amounts.
 4. Other liquids are processed in the body as foods.
 5. Weight/24 rule

4 MAIN TRIGGERS FOR THE BRAIN'S ATTENTION

1. Physical need
2. Use of your name
3. Self-made choice
4. Novelty



**REMEMBER THE
“MOVEMENT FORMULA”!**



Avoid screen saver mode!!



IMPORTANCE OF OXYGEN TO THE BRAIN

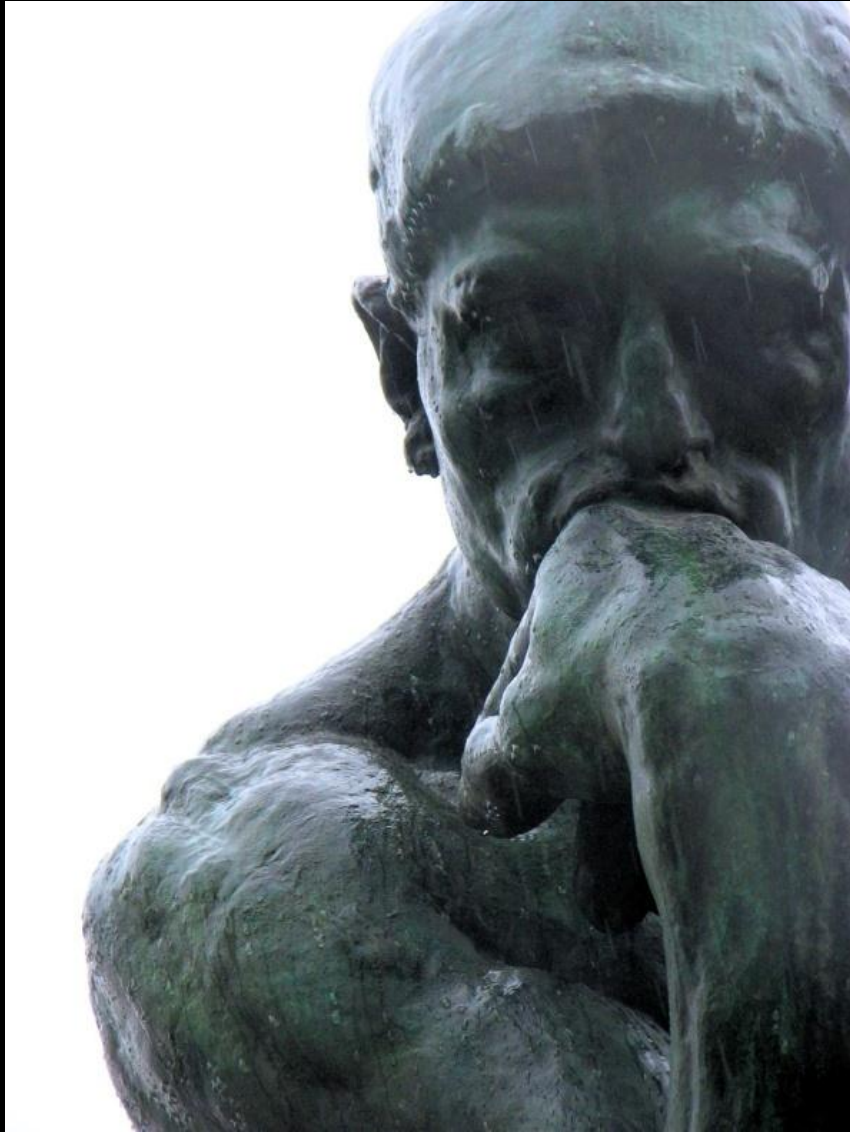
- Standing increases your heartbeat by **10** beats per minute.
- **15%** more blood goes to the brain when you are standing. This improves focus and attention.

**WE CAN ONLY PAY ATTENTION
FOR SO LONG....**



WIFEM?

(What's In It for Me?)



**WE NEED TIME
TO
“GO INTERNAL”.**

STRESS ALWAYS AFFECTS THE BRAIN!

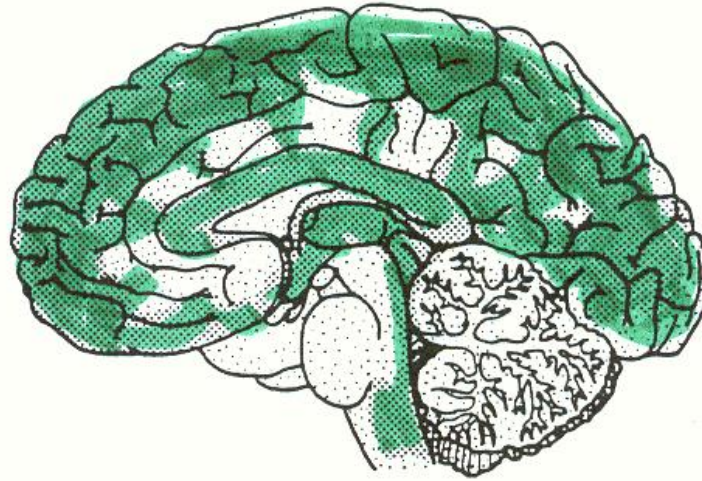


DOWNSHIFTING:

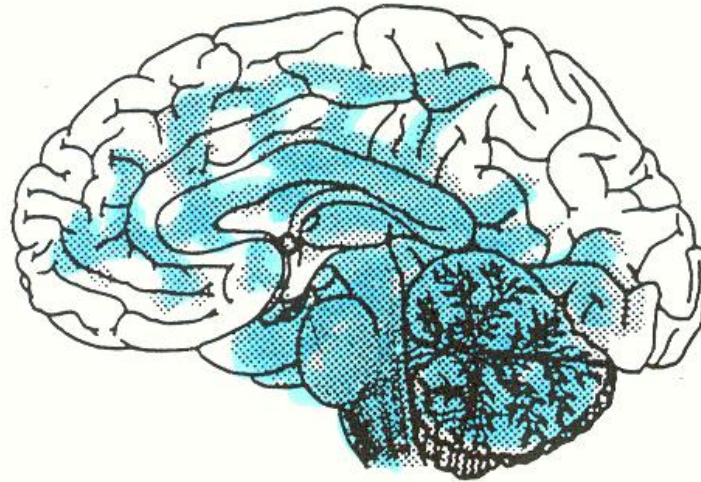
Brain changes from a higher level of thought to a lower level



Brain Activity in States of:



High Challenge, Low Stress



Stress, Anxiety, Threat or
Induced Learner Helplessness

STRESS/THREATS CAN BE DEFINED AS:

- **Physical**
- **Intellectual**
- **Emotional**



**LAUGHTER IS THE BEST
MEDICINE!**





When we
laugh,
we break
the stress
cycle!!!

GENDER DIFFERENCES AND THE BRAIN

ELEMENTARY CHILDREN



BOYS ARE OFTEN GUILTY OF “SELECTIVE HEARING”

- Research shows that from birth, girls can generally hear better than boys.



- Boys seem to have special difficulty hearing the higher-pitched female voice...especially from a distance.



We need to be close to boys and have their attention when we're talking to them.

GENERALLY BOTH BOYS AND GIRLS LIKE TO READ



They just like to read different things!



- Girls often prefer fiction.
- They may prefer short stories and novels.
- They want books about characters they can analyze.

- Boys often prefer nonfiction—battles, real events.
- They want action.
- They want to do some analytical deconstruction.

Reading interest and scores may be lower for boys because we aren't offering them engaging materials.

GIRLS “WEAR THEIR EMOTIONS ON THEIR SLEEVE” WHILE BOYS “CLAM UP”

Boys and girls naturally process emotions differently

- Girls process emotions in the amygdala, and then in the cerebral cortex as they get older. This helps them talk about what they're feeling.**



- Boys process emotions in the amygdala, and they tend to stay there. It is generally harder for them to understand and express their feelings.**



Give boys more time to talk about their feelings and understand that it doesn't come naturally or easily.

BOYS ARE GENERALLY BIGGER RISK-TAKERS

Boys and girls assess risk differently and differ in their likelihood of engaging in risky behaviors.

- Girls are less likely to enjoy taking risks and less impressed by risk-taking behavior.**
- Girls may be willing to take risks, but are less likely to seek out risky situations just for the sake of living dangerously.**

- Many boys enjoy taking risks and are impressed when other boys take risks....especially if they succeed.**
- Boys often see risk-taking as being fun for its own sake.**
- A boy is more likely to do something dangerous while other boys are around.**

Children who are major risk-takers need training to become more risk-averse. Children who are always afraid to take risks need training to become less risk-averse.

If you have one of those boys who really needs to be aggressive and likes to take risks, does he have a safe outlet to do so???

“The solution to taming a boy’s aggressive drive is NOT to squelch it every time it appears. Instead it needs to be transformed into something constructive. You can’t turn a bully into a flower child. But you can turn a bully into a knight. Affirm the knight.”

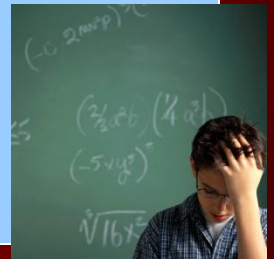
STRESS IS ALWAYS A BAD THING!

Stress can sometimes be a good thing....it depends on the situation and the gender!

- Girls often report feeling dizzy and “yucky” when exposed to threat or confrontation.



- When some young boys are exposed to threat or confrontation they report that their senses seem sharper and they feel an exciting tingle.



While stress is generally a negative experience for girls, it is actually a positive experience for some boys.
But finding the “fine line” is absolutely critical!!!

TEENAGERS (AND BEYOND)

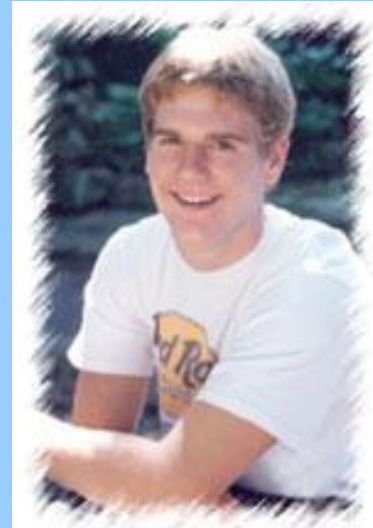


GIRLS HAVE BETTER WRITING SKILLS THAN BOYS

8th grade girl



11th grade boy



The average 11th grade boy writes at the same level as the average 8th grade girl.

BOTH BOYS AND GIRLS ARE GENERALLY VERY REALISTIC ABOUT THEIR ABILITIES

Girls tend to *underestimate* their abilities and skills and often need to be pushed and built up.



Boys tend to *overestimate* their abilities and skills and often need a reality check to make them realize they may not be as brilliant as they think, and they may need to be challenged.



Think about this in relation to risk-taking!

GIRLS AND BOYS NEED TEACHERS TO TREAT THEM THE SAME WAY

- **Girls think it's fine to be friends with the teacher.**
- **Being friends with a teacher may raise one's status in the eyes of other girls.**
- **Girls want to succeed and to please teachers and other adults**
- **Teachers can look girls in the eye and smile when working with them.**

- **Boys think it's weird to be friends with a teacher.**
- **Being friends with a teacher may lower one's status in the eyes of other boys.**
- **Boys see failures as relevant only to a specific subject area and aren't as concerned about pleasing adults.**
- **Teachers should work shoulder-to-shoulder with boys and spread materials out. They are not comfortable when the teacher looks them in the eye.**

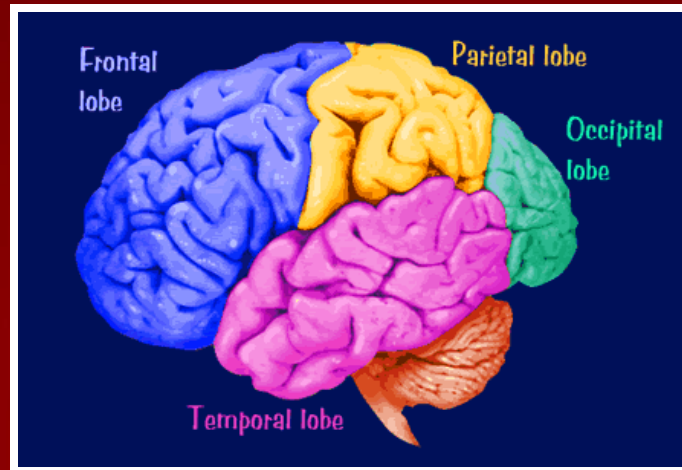
AND, AS FOR THE
SPECIAL TEENAGE BRAIN....

MASSIVE RECONSTRUCTION IS ONGOING!



**FRONTAL LOBES ARE CRITICAL
(AND STILL DEVELOPING!)**

FRONTAL LOBES



- **Abstract and critical thinking; problem-solving**
- **Largest part of the cortex (thinking part of the brain)**
- **Development can result in a change in a teen's morals**

The background of the slide features a red sunburst pattern. The top half has rays emanating from the top center, and the bottom half has rays emanating from the bottom center, both in a darker shade of red. The central area is a solid black rectangle where the text is located.

**THEY DON'T HAVE
ADULT BRAINS!**

WHAT WE NEED TO DO....

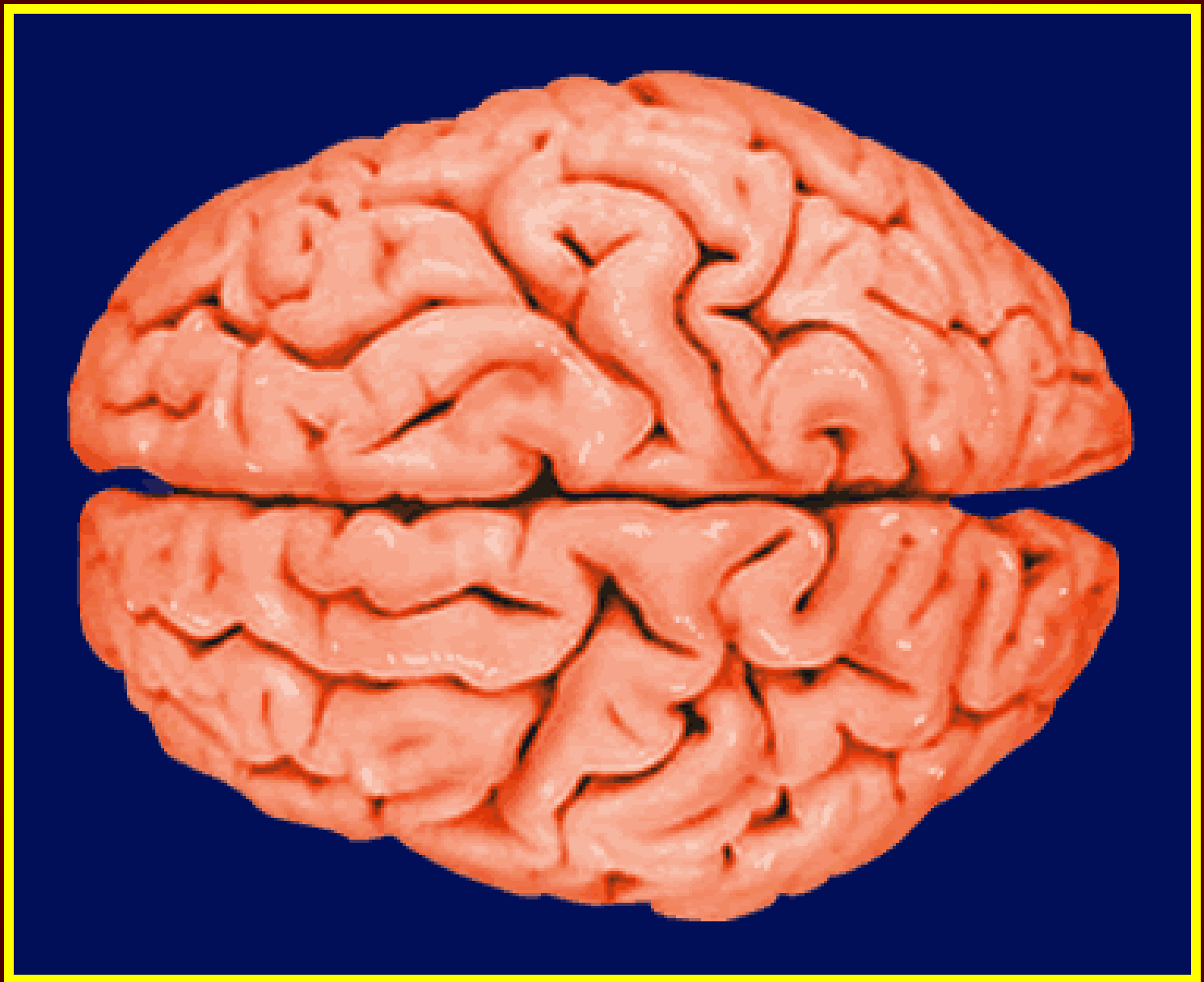
- **Teach students (and parents) the importance of sleep**
- **Consider school start times and scheduling**
- **Stress brain-friendly/healthy breakfasts**
- **Allow and encourage water consumption**
- **Use proven attention-getting techniques**
- **Build in appropriate movement**
- **Plan for processing time**
- **Monitor stress**
- **Promote a physically safe, emotionally secure, fun-loving classroom**

- **Accept gender differences (Elementary)**
 - Boys don't hear as well
 - Collect books that appeal to each gender
 - Remember they process emotions differently
 - Develop safe outlets for risk taking
- **Accept gender differences (Secondary)**
 - Differentiate writing skills and expectations
 - Coach through immediate and accurate feedback
 - Understand the gender research to help students feel emotionally secure

AND SPECIFICALLY REGARDING TEENAGERS....

- Remember that they are undergoing daily reconstruction
 - Understand
 - Accept
 - Support
 - Love
- **THEY DON'T HAVE ADULT BRAINS!**

**TRY TO GROW NEW
WRINKLES EVERY DAY!**



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